

Decontamination, Decommissioning, and Remediation Optimal Planning System (DDROPS) Deployment

Accelerated Site Technology Deployment Integrated Decontamination and Decommissioning Project



Need

Many surplus facilities within the Department of Energy (DOE) complex need to be Decontaminated and Decommissioned and contain a variety of contaminants. As these facilities are dismantled, the waste generated needs to be disposed of properly and according to its contamination type and level. An organized way to dismantle facilities is important so that waste volumes, disposal costs, and worker radiation exposure will be minimized.

Technology Description

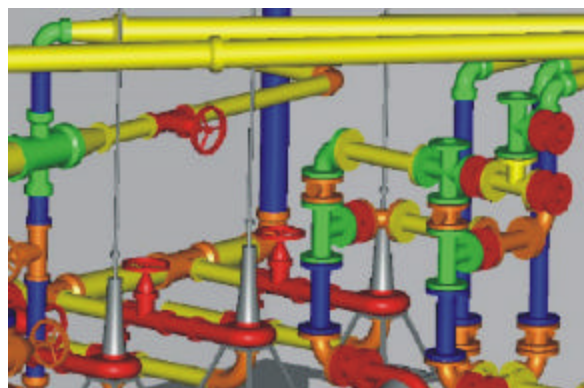
To efficiently cut and package contaminated waste generated from dismantling a facility, engineers and programmers at the Idaho National Engineering and Environmental Laboratory (INEEL) have developed a special computer interface known as the Decontamination, Decommissioning, and Remediation Optimal Planning System (DDROPS). DDROPS provides a size reduction and packaging plan for tanks, piping, and other dismantled equipment. From facility drawings, photographs, and video images, engineers create a 3dimensional model using ProEngineer. This 3-D model can be made to visualize the area with colors representing different characteristics for individual components within the structure, such as the level of radiation or the material composition. Next, the optimal number and location of cuts (with respect to length, mass properties, and radiation) is determined using an optimization program. This system also shows how to package segmented items into waste containers and keeps an inventory of waste box contents. Modeling, cutting, and packaging can all be videotaped for later viewing. The INEEL has been awarded a patent on the DDROPS system.

Benefits

DDROPS helps train operators by providing a preview of their job so they can better plan and perform Decontamination and Decommissioning (D&D) work. It determines packaging

routes, resulting in improved packing densities and reduced waste volumes. As a result, disposal costs are reduced and less storage space is filled. This tool can also reduce the risk of radiation exposure to workers. By knowing where to cut before entering the job site and where the "hot spots" are, workers don't have to estimate or guess where to cut, minimizing the cuts made and reducing time spent in a contaminated area. Having a detailed inventory of the waste containers' contents also is a great benefit.

Status



Workers have deployed DDROPS at the Test Reactor Area 660 Advanced Reactivity Measurement Facility and Coupled Fast Reactivity Measurement Facility (ARMF/CFRMF) which is scheduled to be completed near the end of August 1999. With the model created by DDROPS, operators determined a better procedure for the removing a reactor inside this facility. Instead of cutting up the reactor while it was under water, they decided to remove it whole prior to segmenting. From the model, engineers could calculate the location of the center of gravity and the best place to attach brackets required to lift the reactor. The program provides animation showing removal so workers can easily visualize cutting and packaging. D&D managers plan to use DDROPS for subsequent Decontamination and Decommissioning projects.

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